Tavola I. Formule di Mac Laurin con resto di Peano

$$
\begin{aligned}
e^x &= 1 + x + \frac{x^2}{2} + \dots \quad \dots + \frac{x^n}{n!} + o(x^n) \\
\sin(x) &= x - \frac{x^3}{3!} + \frac{x^5}{5!} \dots \quad \dots + (-1)^n \frac{x^{2n+1}}{(2n+1)!} + o(x^{2n+2}) \\
\cos(x) &= 1 - \frac{x^2}{2!} + \frac{x^4}{4!} \dots \quad \dots + (-1)^n \frac{x^{2n}}{(2n)!} + o(x^{2n+1}) \\
\operatorname{arctg}(x) &= x - \frac{x^3}{3} + \frac{x^5}{5} \dots \quad \dots + (-1)^n \frac{x^{2n+1}}{(2n+1)} + o(x^{2n+2}) \\
\log(1+x) &= x - \frac{x^2}{2} + \frac{x^3}{3} \dots \quad \dots + (-1)^{n-1} \frac{x^n}{n} + o(x^n) \\
\operatorname{tg}(x) &= x + \frac{x^3}{3} + \frac{2x^5}{15} + o(x^7) \\
(1+x)^\alpha &= 1 + \alpha x + \binom{\alpha}{2} x^2 \dots \ \dots + \binom{\alpha}{n} x^n + o(x^n)
\end{aligned}
$$

dove

$$
\binom{\alpha}{n} = \frac{\alpha(\alpha-1)(\alpha-2)\dots(\alpha-n+1)}{n!}
$$

.In particolare

$$
\begin{aligned}
\frac{1}{1-x} &= 1 + x + x^2 \dots\dots\dots\dots + x^n + o(x^n) \\
\frac{1}{1+x} &= 1 - x + x^2 \dots \ \dots + (-1)^n x^n + o(x^n).
\end{aligned}
$$